

DOCUMENT RESUME

ED 042 510

PS 003 438

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TITLE Psycholinguistic Behaviors of Isolated, Rural Children with and without Kindergarten.
INSTITUTION South Carolina Univ., Columbia. School of Education.
PUB DATE 24 Apr 70
NOTE 18p.; Paper presented to the Southeastern Meeting on Child Development, University of Georgia, Athens, Georgia, April 24, 1970

EDRS PRICE EDRS Price MF-\$0.25 HC-\$1.00
DESCRIPTORS *Compensatory Education Programs, *Early Experience, Educational Disadvantage, Grade 1, Inservice Teacher Education, *Kindergarten Children, *Language Skills, Linguistic Competence, Longitudinal Studies, Program Effectiveness, *Rural Education, Statistical Analysis, Test Results

IDENTIFIERS Illinois Test Of Psycholinguistic Abilities, ITPA

ABSTRACT

This paper reports part of a longitudinal study to assess the psycholinguistic abilities of rural children given various educational opportunities. Twenty-two kindergartens were established, each with a teacher and a teacher aide. Prior to the opening of school, the staff was exposed to a six-week intensive training session. An inservice training program stressed personal and professional preparation throughout the year. The kindergarten program was informal but emphasized language development activities. Evaluation was based on the Illinois Test of Psycholinguistic Abilities (ITPA) administered to randomly selected samples of 32 no-kindergarten and 31 kindergarten children at the end of five months in their "enriched" first grades in high priority (low economic status) schools. Data processed through both multivariate analysis of variance and analysis of variance revealed that subjects with kindergarten experience scored significantly higher than those without kindergarten on six of the ten subtests. While the need for more carefully controlled research was indicated, early education did appear to be important for this population. (WY)

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**Psycholinguistic Behaviors of Isolated, Rural Children With
and Without Kindergarten**

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Paper Presented to Southeastern Meeting on Child Development, University
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With appreciation to:

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Williamsburg County Schools

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Although educators are generally in agreement that language abilities are crucial in the consideration of variables to be included in requisites for school achievement, research involved with language skills of rural, poor children is scarce. The work reported here is part of a longitudinal study designed to assess the psycholinguistic abilities of rural children who have been afforded various educational opportunities.

A general demographic description of the area in which the data were collected and certain educational features will be described. Then, the general design of the study, the results, and implications will be given.

Williamsburg County, South Carolina is a predominantly rural county whose economy is based primarily on agriculture. The public school system is the largest employer in the county. According to a rural poverty status index developed by the United States Department of Agriculture, Williamsburg County ranked seventeenth from the lowest of the 3,081 counties in the United States. The average family income in 1960 was \$1.631 which was the lowest of any county in South Carolina and 68.3 percent of the families had incomes of less than \$3,000. In the total population over twenty-five years of age, 31.3 percent have completed less than five years of formal education; approximately 78 percent of the population is black. There are

eight of the thirteen elementary schools in the county classified as high priority schools.¹ Likewise, seven high schools have high priority status. In the spring of 1968, only 12 percent of the 535 graduates entered post high school programs. The United States average was 75.9 percent and the South Carolina average was 57.9 percent.

Administrative personnel in the school system accepted the responsibility of chief change-agent in breaking the socio-economic-educational poverty cycle in Williamsburg County. The problems of low motivation, retention, underachievement, illiteracy, and drop out which lead to eventual unemployment and the out-migration of uneducated, unskilled youth were apparent. The County Superintendent of Education together with his constituents determined that the educational system had to change and Early Childhood Education was identified as the area for the greatest concentration of effort. In order to insure a higher quality of education, training and retraining of the instructional staff was mandatory and was begun.

¹High priority is based primarily on the low economic status of majority of the students.

Funded under Title I, twenty-two kindergartens for five year olds were placed in the eight high priority elementary schools in the 1968-69 year. Each kindergarten was staffed by a team of a teacher and a teacher assistant. Prior to opening of the 1968-69 school year, a six weeks intensive training session was held for the instructional staff. The forty-four teachers and assistants and ten substitutes spent five hours a day for the six weeks exploring curriculum approaches and appropriate learning materials for young children. Specialists from all academic areas worked with the staff. Particular emphasis on language development schemes was stressed. In-service training throughout the year for administrators and kindergarten personnel included a full day once a month with two or more specialists, regular classroom supervision by county staff members and local administrators and video-taped classroom sessions followed by conferences.¹

The kindergarten classrooms were staffed by two adults and were designed physically for learning centers. The rooms were well-equipped with a vast array of materials for educational experiences for young children. Instruction was largely informal with the exception of short periods with small numbered groups in a modified Bereiter approach to language. Later during the year the Goldberg PLC lessons were used.² However, each day was filled with schemes for enhancing language and providing children the opportunity of commerce with equipment and materials that could expand their horizons and could build more meaningful background that seems to be a requisite for language production.

¹Information taken from COP proposal, 1969, Williamsburg County, South Carolina.

²Perception Language and Cognition, materials were supplied by Dr. Jane Raph, Rutgers University through permission from Dr. Miriam Goldberg, Teachers College, Columbia University.

The first grade classrooms in 1968-69 were staffed by one adult and physically were equipped with desks in rows or tables and chairs. For the most part, the rooms were void of materials and equipment that could be self selected by children. The primary learning tools were reading series materials, paper and writing tools. The instruction was highly structured for total group participation in a teacher dominated atmosphere. No special training was held with the first grade teachers in 1968-69.

In the summer of 1969 physical changes were made in the first grade classrooms. Walls between classes were removed, tables and small chairs were added, moveable work benches and shelves were constructed for all classes. The design of openness gave more flow through space for first grade instruction. Learning centers were created and teacher assistants for first grades were added to the staff. A wide variety of manipulative and instructional materials was supplied for all first grades.

A three credit seminar in early childhood education was taken by all first grade and kindergarten teachers, teacher-assistants, and administrators. Specific content area specialists offered concentrated periods of instruction in the mornings and afternoons were spent in self selected activities in the skill development room (adult) library, audio-visual room, one of the newly designed and furnished first grade rooms or one of the content learning centers from the morning sessions. At least five hours a day for three weeks were spend in personal and professional improvement.

Subjects and Problem

From the eight high priority elementary schools, a randomly selected sample of thirty-two first grade children who had no kindergarten experience were administered the ITPA at the end of five months of school (last two weeks of January, 1969). From the same eight high priority elementary schools,

a randomly selected sample of thirty-one first grade children who had kindergarten experience (1968-69) were administered the ITPA at the end of five months of school (last two weeks of January, 1970).

The problem was to determine differences and liknesses of the psycholinguistic abilities of a selected sample of first grade subjects with kindergarten experience and first grade subjects with no kindergarten experience from the eight poverty schools and to analyze the discrepancy, if any, existing between psycholinguistic age (PLA) and chronological age (CA). Comparisons were made according to:

1. First grade subjects with kindergarten experience and first grade subjects with no kindergarten experience.
2. All girls with and without kindergarten and all boys with and without kindergarten.
3. First grade girls with no kindergarten and first grade boys with no kindergarten.
4. First grade girls with kindergarten and first grade boys with kindergarten.
5. First grade girls with kindergarten and first grade girls with no kindergarten.
6. First grade boys with kindergarten and first grade boys with no kindergarten.

The data were subjected to multivariate analysis of variance (MANOVA) and univariate analysis of variance (ANOVA). They were analyzed in the University of South Carolina Computer Center.

Findings:

Comparisons of first grade subjects who had received one year of kindergarten experience with first grade subjects who had no kindergarten experience yielded significant differences on subtest scaled scores of the ITPA. MANOVA gave an F of 8.17 ($p < .001$). The group means and the standard deviations with respect to the ten subtest scaled scores for first grade subjects with kindergarten and first grade subjects with no kindergarten subjects are given in Table 1.

Table 1

Group Means and Standard Deviations for First Grade Subjects With Kindergarten Experience and First Grade Subjects with No Kindergarten Experience on the Ten Subtests Scaled Scores of the ITPA.

Subtests of <u>ITPA</u>	First Grade Subjects With Kindergarten N = 31		First Grade Subjects With no Kindergarten N = 32	
	Mean	S. D.	Mean	S. D.
Auditory Reception	27.871	4.958	25.938	6.101
Visual Reception	32.290	6.326	28.719	6.356
Auditory Association	24.387	8.973	16.563	8.553
Visual Association	30.065	8.358	21.781	10.006
Verbal Expression	30.581	5.005	25.969	4.351
Manual Expression	33.839	5.404	28.375	6.163
Grammatic Closure	19.935	5.727	17.375	5.470
Visual Closure	40.323	7.604	26.594	7.543
Auditory Memory	35.194	8.738	33.750	8.969
Visual Memory	20.516	10.036	22.719	11.521

The results of the univariate analysis of variance performed following MANOVA indicated that first grade subjects with kindergarten experience scored significantly higher than first grade subjects with no kindergarten experience on six of the ten subtests. Table 2 shows the univariate F values and probability levels of the comparisons of the two groups on the ten subtests of the ITPA.

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Table 2

F values and Probability Levels of the Ten Subtest Scaled Scores on the ITPA for First Grade Subjects With Kindergarten Experience and First Grade Subjects With No Kindergarten Experience.

Subtests of <u>ITPA</u>	<u>F</u>	<u>p</u>
Auditory Reception	1.898	< .173
Visual Reception	4.995	< .029
Auditory Association	12.557	< .001
Visual Association	12.675	< .001
Verbal Expression	15.263	< .001
Manual Expression	13.962	< .001
Grammatic Closure	3.295	< .074
Visual Closure	51.747	< .001
Auditory Memory	0.418	< .520
Visual Memory	0.653	< .422

The subtests which yielded no significant differences between the two groups were auditory reception, grammatic closures, auditory memory, and visual memory. All of the other six subtest scores were statistically different.

Comparisons of first grade girls with and without kindergarten experience and boys with and without kindergarten experience yielded no significant differences on the subtest scaled score of the ITPA. The group means and standard deviations of the girls and boys are given in Table 3.

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Table 3

Group Means and Standard Deviations for Girls With and Without Kindergarten Experience and Boys With and Without Kindergarten Experience on the Ten Subtest Scaled Scores of the ITPA.

Subtests of <u>ITPA</u>	Girls N = 31		Boys N = 32	
	Mean	S. D.	Mean	S. D.
Auditory Reception	26.806	5.394	26.969	5.894
Visual Reception	30.032	6.616	30.906	6.547
Auditory Association	22.226	9.865	18.656	9.029
Visual Association	25.806	10.489	25.906	9.802
Verbal Expression	28.032	5.154	28.438	5.309
Manual Expression	30.871	5.841	31.250	6.951
Grammatic Closure	18.742	5.391	18.531	6.069
Visual Closure	32.484	10.519	34.188	10.001
Auditory Memory	33.548	8.590	35.344	9.075
Visual Memory	19.839	9.768	23.375	11.575

MANOVA yielded on F values of .866 ($p < .57$). No significant differences existed between all girls and all boys on any of the ten subtests of the ITPA. Univariate analyses on each subtest also revealed no differences on each individual subtest.

MANOVA of first grade girls and boys psycholinguistic abilities with no kindergarten experience yielded no significant differences ($F = 1.96$; $p < .09$). The group means and standard deviations with respect to the ten subtest scaled scores for both groups are given in Table 4.

Table 4

Group Means and Standard Deviations for First Grade Girls and Boys With No Kindergarten Experience on the Ten Subtest Scaled Scores of the ITPA.

Subtests of <u>ITPA</u>	Girls N = 16		Boys N = 16	
	Mean	S. D.	Mean	S. D.
Auditory Reception	25.313	5.17	26.563	7.023
Visual Reception	28.125	5.954	29.313	6.877
Auditory Association	16.625	8.429	16.500	8.952
Visual Association	21.500	11.507	22.063	8.621
Verbal Expression	25.688	4.110	26.250	4.698
Manual Expression	28.063	4.640	28.583	7.534
Grammatic Closure	16.625	4.731	18.125	6.185
Visual Closure	25.250	7.298	27.938	7.776
Auditory Memory	30.375	8.115	37.125	8.724
Visual Memory	21.313	10.965	24.125	12.241

The results of the univariate analysis of variance performed following MANOVA indicated that scores on the auditory memory subtest for girls did differ significantly in favor of the boys ($F = 5.14$ $p < .031$).

Comparisons of first grade girls and boys with kindergarten experience showed no significant differences when the results of MANOVA were analyzed ($F = 1.18$; $p < .36$). The group means and standard deviations with respect to the ten subtest scaled scores for both groups are given in Table 5.

Table 5

Group Means and Standard Deviations for First Grade Girls and Boys With Kindergarten Experience on the Ten Subtest Scaled Scores of the ITPA.

Subtest of <u>ITPA</u>	Girls N = 15		Boys N = 16	
	Mean	S. D.	Mean	S. D.
Auditory Reception	28.400	5.329	27.375	4.703
Visual Reception	32.067	6.871	32.500	5.989
Auditory Association	28.200	7.636	20.813	8.856
Visual Association	30.400	7.079	29.750	9.630
Verbal Expression	30.533	5.083	30.625	5.097
Manual Expression	33.867	5.604	33.813	5.394
Grammatic Closure	21.000	5.264	18.938	6.126
Visual Closure	40.200	7.514	40.438	7.933
Auditory Memory	36.933	7.986	33.563	9.345
Visual Memory	18.267	8.396	22.625	11.218

The results of the univariate analysis of variance performed following MANOVA indicated girls scored significantly higher ($F = 6.15$; $p < .02$) than boys on the auditory association subtest.

Comparisons of first grade girls with kindergarten experience and first grade girls with no kindergarten experience yielded significant differences on subtest scaled scores of the ITPA ($F = 4.79$; $p < .001$). The group means and standard deviations with respect to the ten subtest scaled scores for both groups are given in Table 6.

Table 6

Group Means and Standard Deviations for First Grade Girls With Kindergarten Experience and First Grade Girls With No Kindergarten Experience on the Ten Subtest Scaled Score of the ITPA.

Subtests of <u>ITPA</u>	First Grade Girls With Kindergarten N - 15		First Grade Girls With No Kindergarten N = 16	
	Mean	S. D.	Mean	S/ D.
Auditory Reception	28.400	5.329	25.313	5.173
Visual Reception	32.067	6.871	28.125	5.954
Auditory Association	28.200	7.636	16.625	8.429
Visual Association	30.400	7.079	21.500	11.507
Verbal Expression	30.533	5.083	25.688	4.110
Manual Expression	33.867	5.604	28.063	4.640
Grammatic Closure	21.000	5.264	16.625	4.731
Visual Closure	40.200	7.514	25.250	7.298
Auditory Memory	36.933	7.986	30.375	8.115
Visual Memory	18.267	8.396	21.313	10.965

The results of the univariate analysis of variance performed following MANOVA indicated that first grade girls with kindergarten experience scored significantly higher than first grade girls with no kindergarten experience on seven of the ten subtests. The results of ANOVA are given in Table 7.

Table 7

F Values and Probability Levels of the Ten Subtest Scaled Scores on the ITPA for First Grade Girls With Kindergarten Experience and First Grade Girls With No Kindergarten Experience.

	<u>F</u>	<u>P</u>
Auditory Reception	2.679	0.113
Visual Reception	2.925	0.098
Auditory Association	15.982	0.001
Visual Association	6.617	0.015
Verbal Expression	8.570	0.007
Manual Expression	9.917	0.004
Grammatic Closure	5.938	0.021
Visual Closure	31.572	0.001
Auditory Memory	5.135	0.031
Visual Memory	.746	0.395

The only subtests which yielded no significant differences between the two groups were auditory reception, visual reception and visual memory. All of the other seven subtests scores were statistically different.

Comparisons of first grade boys with kindergarten experience and first grade boys with no kindergarten experience yielded significant differences on subtest scaled scores of the ITPA ($F = 3.98$; $p < .004$). The group means and standard deviations with respect to the ten subtest scaled scores for both groups are given in Table 8.

Table 8

Group Means and Standard Deviations for First Grade Boys With Kindergarten Experience and First Grade Boys With No Kindergarten Experience on the Ten Subtest Scaled Scores of the ITPA.

Subtest of <u>ITPA</u>	First Grade Boys With Kindergarten N = 16		First Grade Boys With No Kindergarten N = 16	
	Mean	S. D.	Mean	S. D.
Auditory Reception	27.375	4.703	26.563	7.023
Visual Reception	32.500	5.989	29.313	6.877
Auditory Association	20.813	8.856	16.500	8.952
Visual Association	29.750	9.630	22.063	8.621
Verbal Expression	30.625	5.097	26.250	4.698
Manual Expression	33.813	5.394	28.688	7.534
Grammatic Closure	18.938	6.126	18.125	6.185
Visual Closure	40.438	7.933	27.938	7.776
Auditory Memory	33.563	9.345	37.125	8.724
Visual Memory	22.625	11.218	24.125	12.241

The results of the univariate analysis of variance performed following MANOVA indicated that first grade boys with kindergarten scored significantly higher than first grade boys with no kindergarten on four of the ten subtests. The results of the analysis of variance are given in Table 9.

Table 9

F Values and Probability Levels of the Ten Subtest Scaled Scores on the ITPA for First Grade Boys With Kindergarten Experience and First Grade Boys With No Kindergarten Experience.

	<u>F</u>	<u>P</u>
Auditory Reception	.148	< .703
Visual Reception	1.955	< .172
Auditory Association	1.877	< .181
Visual Association	5.660	< .024
Verbal Expression	6.374	< .017
Manual Expression	4.895	< .035
Grammatic Closure	.139	< .712
Visual Closure	20.261	< .001
Auditory Memory	1.242	< .274
Visual Memory	.131	< .720

The subtests which yielded significant differences between the two groups were visual association, verbal expression, manual expression, and visual closure.

Table 10 indicates the analysis of variance comparison of the difference between Chronological Age (CA) and Psycholinguistic Age (PLA) as measured by the ITPA for first grade subjects with kindergarten experience and first grade subjects with no kindergarten experience.

Table 10

Analysis of Variance for Discrepancy Between CA and PLA on the ITPA for First Grade Subjects With Kindergarten Experience and First Grade Subjects With No Kindergarten Experience.

Source of Variance	s.s.	df	M.S.	<u>F</u>	<u>P</u>
Between Groups	1,564.46	1	1,564.46	14.36	< .001
Within Groups	6,644.97	61	108.93		
Total	8,209.43	62			

The discrepancy between CA and PLA as measured by the ITPA was significantly less for first grade subjects with kindergarten than first grade subjects with no kindergarten experience. While the mean discrepancy for first grade subjects with kindergarten was 13.03 months, the mean discrepancy for first grade subjects with no kindergarten experience was 23.00 months.

Summary of Findings:

1. Comparisons of first grade subjects who had received one year of kindergarten experience with first grade subjects who had no kindergarten experience yielded significant differences on the subtest scaled scores of the ITPA. MANOVA yielded an F value of 8.172 ($p < .001$). Children who had experienced kindergarten prior to first grade scored significantly higher on six of the ten subtests. The subtests which indicated no significant differences were auditory reception, grammatic closure, auditory memory, and visual memory. The only subtest score achieved by first grade subjects with no kindergarten which was within the average deviation from the mean of the standardized group upon which the test was based was auditory memory. (No significant differences between the two groups) On all other nine subtests the first grade subjects with no kindergarten experience showed deficits. In contrast the first grade subjects with kindergarten scored within average range on six of the ten subtests. Areas of deficit were in auditory reception, auditory association, grammatic closure, and visual memory.

2. No significant differences existed when comparisons of all boys and all girls were made. The MANOVA F was .866 ($p < .57$). The univariate analysis of variance performed following MANOVA showed no significant differences on any of the ten subtest scaled scores.

3. When ITPA scores on first grade girls and first grade boys with no kindergarten experience were subjected to MANOVA, an F value of 1.955 ($p < .094$) existed. The results of the univariate analysis of variance did indicate that boys scored significantly higher on the auditory memory subtest than girls ($F = 5.135$, $p < .031$).

4. Comparisons of first grade boys and girls with kindergarten experience yielded no significant differences with respect to MANOVA ($F = 1.181, p < .358$). The girls did score significantly higher than boys on the auditory association subtest ($F = 6.149, p < .019$).

5. Significant differences were found between first grade girls with kindergarten and first grade girls with no kindergarten. The MANOVA F of 4.786 was significant beyond the .001 level. The results of the univariate analysis of variance indicated that first grade girls who had kindergarten experience scored significantly higher than first grade girls with no kindergarten experience on all but three subtests of the ITPA (auditory reception - $F = 2.679, p < .113$, visual reception - $F = 2.925, p < .098$, and visual memory - $F = .746, p < .395$).

6. When first grade boys with kindergarten were compared to first grade boys with no kindergarten with respect to the subtest scaled scores on the ITPA, significant differences were found (MANOVA $F = 3.982, p < .004$). The results of the univariate analysis of variance test following MANOVA pointed up that first grade boys with kindergarten scored significantly higher than first grade boys with no kindergarten on four subtests (visual association - $F = 5.660, p < .024$, verbal expression - $F = 6.374, p < .017$, manual expression - $F = 4.895, p < .035$, and visual closure - $F = 20.261, p < .001$).

The discrepancy score between Chronological Age and Psycholinguistic Age as measured by the ITPA was significantly less ($p < .001$) for first grade subjects with kindergarten experience. The first grade subjects with kindergarten were behind in PLA but not as severely as the first grade subjects with no kindergarten experience. The mean discrepancy

score showed CA of first grade subjects with kindergarten to differ from their PLA by 13.03 months. The discrepancy score between CA and PLA for first grade subjects with no kindergarten was 23.00 months.

Implications of Study:

Other research conducted in the area of psycholinguistic abilities of "disadvantaged" children has indicated that deficiencies occurred in auditory and verbal aspects of language (Clark, 1966, Deutsch, 1964; Goetzinger, 1960; Kass, 1966, Weaver, 1967). The data reported herein showed quite clearly that first-grade subjects who had the opportunity to attend kindergarten for a full academic year and an "enriched" first grade for five months were superior to first-grade pupils who had not attended kindergarten. The strengths were in the following areas of psycholinguistic abilities:

- | | |
|----------------------|-----------------------|
| 1) Verbal Expression | 4) Visual Association |
| 2) Auditory Memory | 5) Manual Expression |
| 3) Visual Reception | 6) Visual Closure |

There was one psycholinguistic strength found in the first-grade subjects without kindergarten.

- 1) Auditory Memory

In the final analysis, poor rural children profited enormously from kindergarten when compared to counterparts who had not had a similar opportunity. Other data reported earlier (Cowles and Daniel, 1970) showed that kindergarten subjects surpass first-grade subjects after five months of "schooling" (when first-grade subjects have not had kindergarten) in psycholinguistic abilities. Although research in areas other than the ones reported here is definitely needed and many variables may not have been controlled, the recommendation can be made that early education appears to be important.

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